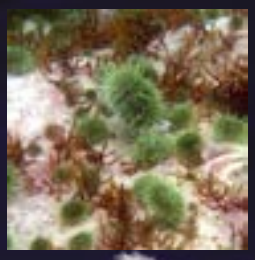
Gulf of Maine Council on the Marine Environment

Action Plan 2007–2012

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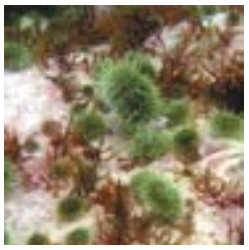


Gulf of Maine
Council on the
Marine Environment

Susan Snow-Cotter hailed from Massachusetts, and she was a leader in coastal management for the entire Gulf of Maine and beyond. With unwavering passion, enthusiasm, and insight, she used innovative approaches to address complex coastal management challenges. She gave unselfishly of her time, was a mentor and inspiration to many, and leaves a legacy of accomplishment.

The *Gulf of Maine Council on the Marine Environment Action Plan 2007–2012* is dedicated to Susan and everything for which she worked.

We already miss her leadership and endless patience.

In memoriam Susan A. Snow-Cotter
1961–2006
Gulf of Maine Councilor
Director, Massachusetts Office of Coastal Zone Management

Citation for this document
Gulf of Maine Council on the Marine Environment. 2007. *Gulf of Maine Council on the Marine Environment Action Plan 2007–2012*. gulfofmaine.org. 30 pages.

ISBN 978-0-9791540-0-3

To contact the Gulf of Maine Council on the Marine Environment, go to gulfofmaine.org. An electronic version of this document is available at the Web site.

Editing and design
Peter H. Taylor, waterviewconsulting.com

Printed on paper containing 50% recycled content (15% post consumer), process chlorine free, with soy inks.

Cover captions
Main image: An image captured by a satellite on August 6, 2006, shows the Gulf of Maine and its watershed in the United States and Canada. The Gulf of Maine is bordered by Massachusetts, New Hampshire, Maine, New Brunswick, and Nova Scotia. At lower left, Cape Cod is the southwestern corner of the Gulf of Maine, while Georges Bank and the southern tip of Nova Scotia define the seaward edge of the Gulf. The color of the water varies depending on sediment, plankton, bathymetry (seafloor topography), and other factors. Resuspended sediment produces areas of brownish water in the Bay of Fundy. Green water generally indicates chlorophyll and phytoplankton, but dissolved substances also can be the cause, especially near the mouths of rivers. At Georges Bank, around Cape Cod, and in other shallow areas, the seafloor and high nutrient levels from tidal mixing influence the water's color. The image was made with a Moderate Resolution Imaging Spectroradiometer (MODIS).

Courtesy of Satellite Oceanography Data Lab, School of Marine Sciences, University of Maine

Insets:
Kayakers in the Gulf of Maine. The Chewonki Foundation
Sea urchins feed on the seafloor. Ted Creaser
A harp seal along the Gulf of Maine's coast. Chuck Whitney
Herring weir at Grand Manan Island. Mary Ellen Nealis

Contents

Along the coast of the Gulf of Maine.
Photo © Peter Taylor

Swimming in the Gulf of Maine.
Photo © Peter Taylor

Executive Summary

The governors and premiers of the five states and provinces that border the Gulf of Maine—Massachusetts, New Hampshire, Maine, New Brunswick, and Nova Scotia—established the Gulf of Maine Council on the Marine Environment in 1989 as a regional entity with a mission to "maintain and enhance environmental quality in the Gulf of Maine and to allow for sustainable resource use by existing and future generations."

The *Gulf of Maine Council on the Marine Environment Action Plan 2007–2012* describes the goals, outcomes, and activities that the Council will pursue through its committees and partnerships in the next five years. The *Action Plan* focuses on key issues that Council members—representing federal, state, and provincial governments; non-government organizations; and business interests—identified as priorities for which they have pledged support and that require or benefit significantly from regional collaboration.

The *Gulf of Maine Council on the Marine Environment Action Plan 2007–2012* was developed by incorporating public input and the findings of numerous studies, workshops, and key policy developments, including the Gulf of Maine Summit, Canada's Oceans Action Plan, and the U.S. Ocean Action Plan. The *Action Plan* builds on results of the Council's previous five-year action plan (2001–2006) and activities under two earlier action plans in the 1990s.

The *Gulf of Maine Council on the Marine Environment Action Plan 2007–2012* contains three overarching, long-range goals:

Goal 1 **Coastal and marine habitats are in a healthy, productive, and resilient condition.**

Goal 2 **Environmental conditions in the Gulf of Maine support ecosystem and human health.**

Goal 3 **Gulf of Maine coastal communities are vibrant and have marine-dependent industries that are healthy and globally competitive.**

The Council is committed to these long-term goals, recognizing that it will take many years to fully realize them. Detailed information about the Council's activities is available in the multi-year *Work Plan* at gulfofmaine.org.

Nikki McLeod

Steven Erat

The Chewonki Foundation

Cruadinx

The Gulf of Maine is one of the world's most productive marine ecosystems. It hosts wildlife such as seals (top left) and valuable commercial fisheries (top right). Recreational fishing (lower right) and kayaking tours (lower left) are popular ways to enjoy the Gulf of Maine.

Preface

The governors of Massachusetts, New Hampshire, and Maine and the premiers of New Brunswick and Nova Scotia created the Gulf of Maine Council on the Marine Environment (the Council) in 1989 as a regional forum with a mission to "maintain and enhance environmental quality in the Gulf of Maine and to allow for sustainable resource use by existing and future generations."

The *Gulf of Maine Council on the Marine Environment Action Plan 2007–2012* describes the goals, objectives, and activities identified by the Council's members—representing federal, state, and provincial governments; non-government organizations; and business interests—as priorities for which they have pledged support.

Many public, non-government, and commercial activities to maintain and enhance environmental quality are occurring throughout the Gulf, carried out effectively and passionately by countless advocates. The Council seeks to build on this work and to serve as a regional catalyst to address priority issues that require or are significantly enhanced by regional collaboration.

As part of the process to identify and clarify the goals and objectives for the *Action Plan*, the Gulf of Maine Council did the following:

- Reviewed its progress and accomplishments over the past five years.
- Analyzed more than fifty recent consensus-based publications produced by government and non-government organizations around the Gulf of Maine.
- Reviewed the proceedings of major conferences.
- Convened the Gulf of Maine Summit in October 2004.
- Consulted Canada's Oceans Action Plan and the U.S. Ocean Action Plan.
- Conducted a Web-based survey of government and non-government representatives.

Further, the Council placed an emphasis on the following elements.

Public Input Guides Council Priorities
The Council sought public comment on possible 2007–2012 priorities. Nearly three-quarters of respondents indicated that the most important role for the Council is to protect and conserve coastal and marine habitats. Their primary concerns were that the effects of land-based activities on coastal habitats should be minimized, that regionally significant coastal habitats should be managed in a way that maintains ecological integrity, and that coastal habitats should be restored to support ecological and economic values. The Council incorporated this public input to help identify the goals and priorities for the *Gulf of Maine Council on the Marine Environment Action Plan 2007–2012*.

- **Enhance accountability.** The *Action Plan* identifies three long-range goals to be achieved via specific long-term outcomes (changes in environmental conditions), mid-term outcomes (changes in people's behavior), and short-term outcomes (changes in people's knowledge or awareness). Performance measures will enable decision-makers and citizens to gauge the progress of the Council and its partners in pursuing these outcomes and goals.
- **Continue to engage partners.** The *Action Plan* identifies activities that will be conducted to achieve the goals and outcomes. Many of the activities will require collaboration among public and private partners to be successful. The Council will initiate and foster partnerships throughout the region.
- **Leverage resources for shared benefits.** The Council is an advisory and collaborative forum with no ongoing, secure funding. However, it is effective in leveraging public and private resources for the benefit of the Gulf's ecosystem. Transboundary sharing of knowledge, resources, and funding is a cornerstone of the *Action Plan*.

A pool in a salt marsh provides habitat for small fish.
Photo © Peter Taylor

Overview

A U.S./Canada Partnership

The Gulf of Maine Council on the Marine Environment is a U.S./Canada partnership of government agencies, non-government organizations, and business interests. The Council's mission is to "maintain and enhance environmental quality in the Gulf of Maine and to allow for sustainable resource use by existing and future generations." The Council organizes conferences and workshops on priority issues; conducts integrated environmental monitoring and data synthesis; performs policy analyses; provides grants and awards; accelerates the transfer of science to management; raises awareness about the Gulf; and connects people, organizations, data, and information in the region.

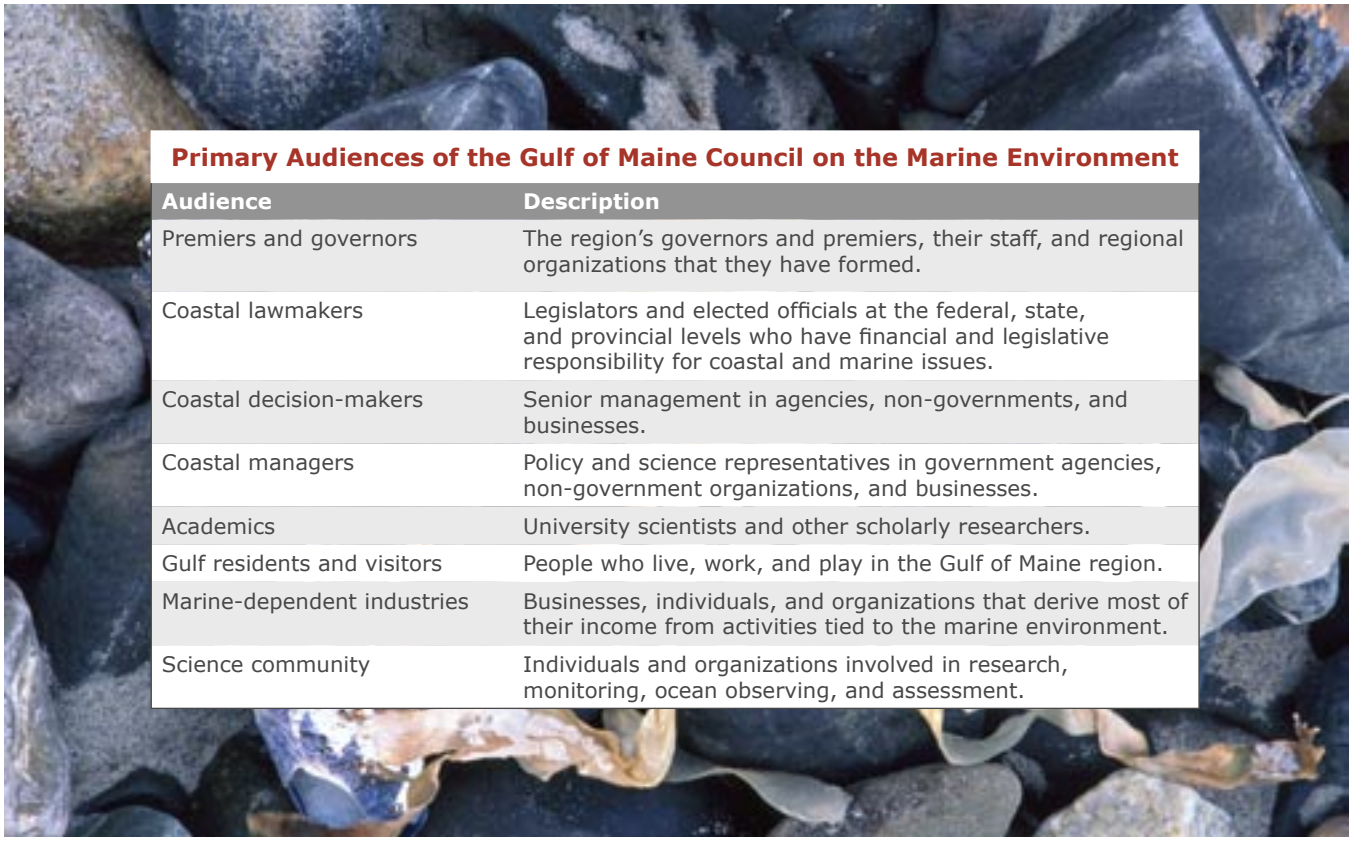
The governors and premiers of the five states and provinces that border the Gulf of Maine—Massachusetts, New Hampshire, Maine, New Brunswick, and Nova Scotia—created the Council in 1989 as a regional forum to exchange information and engage in long-term planning. The Councilors are leaders of state, provincial, and federal agencies; non-government organizations; and the private sector. The Council fosters consensus-based decision-making and collaboration among a wide range of parties with an interest in the Gulf. Its meetings are open to the public, and its five-year action plans incorporate diverse public input.

Representatives of government agencies, academia, businesses, and non-government organizations participate in the Council's committees. On an annual rotating basis, one of the five states and provinces serves as the Secretariat and coordinates the Council's work. Contract staff located around the region work with the Council and its committees to help accomplish its goals. The Council is administered by non-profit associations in the United States and Canada.

Guiding Principles

Four principles guide the Council and participating agencies in their decisions involving the Gulf of Maine ecosystem. Each principle is congruent with other international protocols, as well as state, provincial, and national legislation in Canada and the United States.

1. **Ecologically sustainable development**
   The Council seeks to meet the region's current social, cultural, and environmental needs without compromising the needs of future generations. Working in partnership with others, it strives to sustain ecological processes and enhance the region's quality of life.
2. **Ecosystem-based planning and management**
   The Council supports collaborative management that integrates economic, social, and ecological values and objectives, emphasizing natural rather than political boundaries.
3. **Environmental protection through precaution**
   The Council supports conservation of the coastal and marine environment, and urges its members to proceed with caution to avoid environmental degradation.
4. **Public information and participation**
   The Council is committed to a participatory process that informs and engages the public in setting priorities.



Primary Audiences of the Gulf of Maine Council on the Marine Environment

Audience	Description
Premiers and governors	The region's governors and premiers, their staff, and regional organizations that they have formed.
Coastal lawmakers	Legislators and elected officials at the federal, state, and provincial levels who have financial and legislative responsibility for coastal and marine issues.
Coastal decision-makers	Senior management in agencies, non-governments, and businesses.
Coastal managers	Policy and science representatives in government agencies, non-government organizations, and businesses.
Academics	University scientists and other scholarly researchers.
Gulf residents and visitors	People who live, work, and play in the Gulf of Maine region.
Marine-dependent industries	Businesses, individuals, and organizations that derive most of their income from activities tied to the marine environment.
Science community	Individuals and organizations involved in research, monitoring, ocean observing, and assessment.

Role and Sphere of Influence

- As a transboundary organization, the Council is uniquely positioned to focus on issues that require or benefit significantly from regional collaboration.
- The Council's work often involves collaboration at municipal, state, provincial, national, and bi-national levels.
- While the Council does not have direct regulatory or policy-making authority of its own, its goals and objectives are congruent with state, provincial, and federal priorities. The Council promotes progress toward common goals.
- The Council's work focuses on complex natural and socioeconomic systems, making it a challenge to attribute particular outcomes to the organization's efforts. However, assessing results is essential for continued success.
- A strength of the Council is that it is a coalition of people from many groups. However, this organizational structure can result in the Council's role being camouflaged, as initiatives may occur under the banners of member and partner organizations.
- The Council reports on regional progress toward the goals in this *Action Plan*. This recognition will identify the lead organizations, including direct activities of the Council, its partners, and the work of others.

Vision for the Future

The Council was formed in recognition of the need for natural resource management spanning political and bureaucratic boundaries. In the next five years, as outlined in this *Action Plan*, the Council will advance ecosystem-based approaches to management. Building on its past accomplishments, the Council intends to continue supporting region-wide information gathering and sharing (e.g., seafloor mapping, environmental monitoring, science translation to management, indicators, state-of-the-environment reporting), public outreach and education, habitat restoration, and addressing key science and policy gaps.

The Council will continue to foster innovative approaches to sharing information and enhancing collaboration. By working together in a regional forum, the states, provinces, and federal agencies learn from each other, try new approaches, and coordinate their efforts. As a result, they become better stewards of the resources for which they are responsible.

The Council will continue to nurture strong partnerships among local, regional, and national organizations that are responsive to issues of regional concern. Wherever appropriate, the Council will participate and assist these groups, often seeking to build their capacity by creating strategic alliances.

Resolution of Support by the Federal Partners

to the

Gulf of Maine Council on the Marine Environment

November 2006

THE FEDERAL PARTNERS of the Gulf of Maine Council on the Marine Environment, having worked collaboratively with the Council during its first decade and a half of operation toward the long-term sustainability of this shared ecosystem:

Recognizing this shared responsibility to maintain and enhance environmental quality in the Gulf of Maine and to allow for sustainable resource use by existing and future generations;

Wishing to respond to the encouragement by the Governors and Premiers in their Gulf of Maine Proclamation for the Federal Partners to reaffirm their commitment to the Gulf of Maine Council and to continue to work with the States and Provinces in their efforts to protect the ecosystems of the Gulf of Maine;

INTEND AS FOLLOWS
To continue to support the goals, measurable objectives and priority actions articulated in the Gulf of Maine Council Action Plans to the extent that they are consistent with domestic law and policies, and can be executed within available appropriations;

To continue to actively participate on the Council and, where possible, provide staff members to participate on the Council's Working Group and Committees;

To continue collaborative work with the Gulf of Maine Council and other partners in the region to set and deliver on annual and long-term priorities for action;

To coordinate across sectors represented on the Council to enhance our ability to accelerate implementation of Federal statutory and policy responsibilities by entering into effective partnerships and improve federal interagency coordination;

To actively pursue and advise the Council of opportunities for Federal support;

To develop scientific initiatives and projects in cooperation with the Council, consistent with priorities of the U.S. and Canadian Oceans Action Plans.

While not committing the Federal Agencies to specific investments, this Resolution of Support encourages the Federal Agencies to continue their support for and participation in the Council to succeed in addressing issues that must be solved at a regional scale.

Carol Ann Rose
Regional Director of Oceans & Habitat
Department of Fisheries and Oceans
Canada, Maritimes Region

Jacqueline G. Olsen
Director, Integrated Ecosystems
and Public Education
Environment Canada

William Hogarth
Assistant Administrator for Fisheries
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Atmospheric Administration

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Ocean Services and Coastal
Zone Management
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Atmospheric Administration

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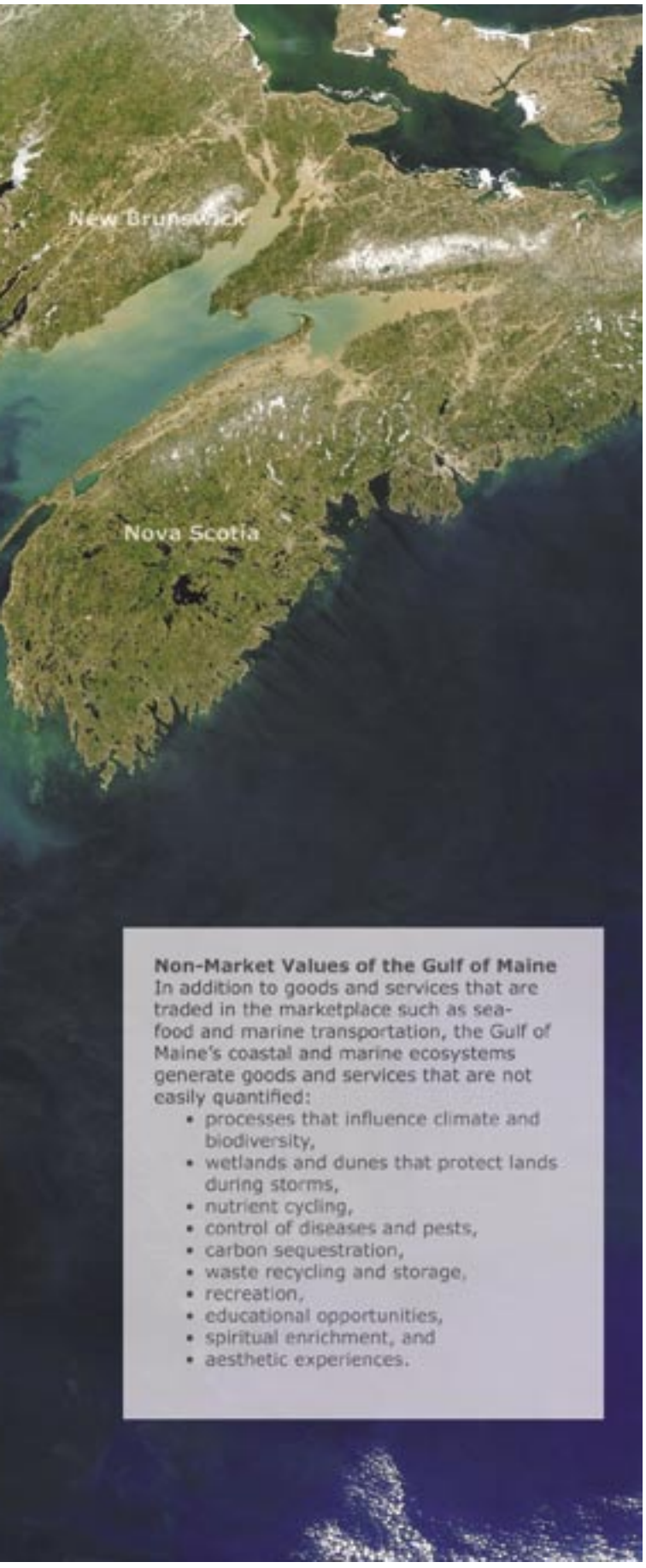
Regional Director, Northeast Region
U.S. Fish and Wildlife Service

David P. Russ
Regional Executive, New England Focus Area
U.S. Geological Survey

Robert W. Varney
New England Administrator
U.S. Environmental Protection Agency

Image courtesy of Satellite Oceanography Data Lab, School of Marine Sciences, University of Maine



Value of the Marine Economic Sector

Nova Scotia
Annual output: $2.62 billion
Percentage of provincial gross domestic product: 10
Percentage of direct household income: 5
Employment: >30,000 direct full-time jobs
Source: Gardner, M., R. Fraser, M. Milloy, J. Frost. 2005. Economic Value of the Nova Scotia Ocean Sector.

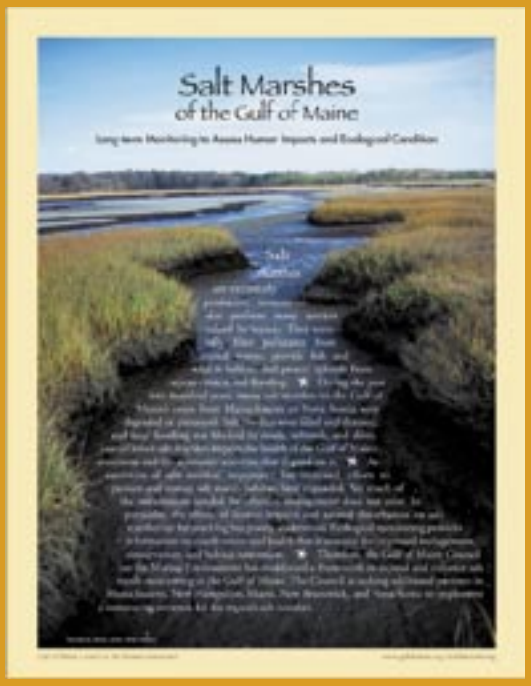
New Brunswick
Total direct impact (1995–97): $610 million
Percentage of provincial gross domestic product: 4.3
Percentage of direct household income: 4.1 ($370 million)
Percentage of total household income: 9.2 ($820 million)
Source: Mandale, M., M. E. Foster, P. Y. Chiasson. 2000. The Economic Value of Marine-related Resources in New Brunswick.

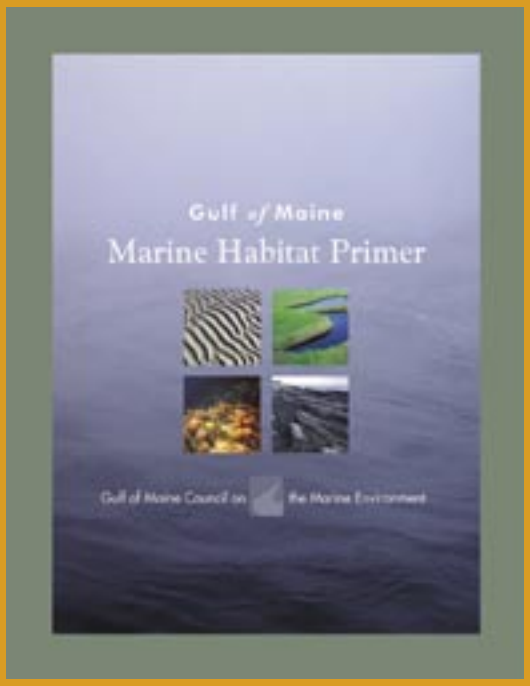
Maine
Major sectors: Construction, living resources, ship/boat building, tourism/recreation, transportation, minerals
Employees: 45,685
Annual wages: $1.2 billion
Largest sectors (employees): Tourism/recreation (30,603), ship/boat building (12,101)
Largest sectors (wages): Ship/boat building ($667 million), tourism/recreation ($470 million)
Source: Colgan, C. 2004. The National Ocean Economics Program.

New Hampshire
Major sectors: Construction, living resources, ship/boat building, tourism/recreation, transportation, minerals
Employees: 14,005
Annual wages: $587 million
Largest sectors (employees): Tourism/recreation (8,336), transportation (5,157)
Largest sector (wages): Transportation ($436 million), tourism/recreation ($130 million)
Source: Colgan, C. 2004. The National Ocean Economics Program.

Massachusetts
Major marine sectors: commercial seafood, transportation, tourism/recreation, science/technology, construction/infrastructure
Estimated total annual marine output: $14 billion
Estimated total marine payroll: $4.3 billion
Estimated secondary coastal employment: 147,000
Coastal economy was 37% of gross state product in 2004
Source: University of Massachusetts/Donahue Institute. 2006. An Assessment of the Coastal and Marine Economies of Massachusetts.

Data were compiled from different sources that varied in their methods and the years analyzed. Data for Massachusetts, New Brunswick, and Nova Scotia include those jurisdictions' entire coasts, not just their coasts on the Gulf of Maine.

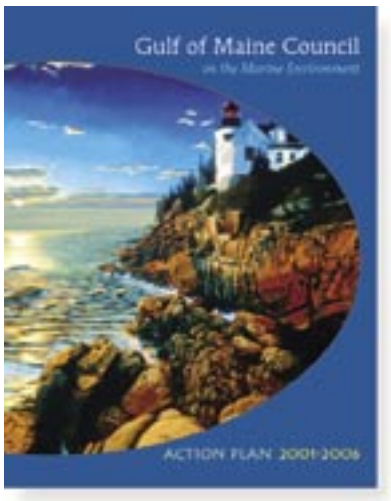




Examples of products of the Gulf of Maine Science Translation Project (gulfofmaine.org/science_translation), which accelerates the transfer of scientific findings to management. The science translators produced these publications in collaboration with the Council's committees and other partners.

Accomplishments from 2001–2006

Every five years, the Gulf of Maine Council creates an action plan that provides a framework for the Council's activities for the next half decade. Each action plan outlines the goals, outcomes, and activities that the Council will pursue through its committees and partnerships. Under the three goals of the *Gulf of Maine Council on the Marine Environment Action Plan 2001–2006*, the Council facilitated regional progress on the issues of habitat protection and restoration, ecosystem integrity, and sustainable maritime activities.



Goal 1 (2001–2006) Coastal and marine habitats throughout the Gulf of Maine are healthy and support the Gulf's diversity of plant and animal species.

Selected accomplishments:

- Between 2002 and 2006, the Gulf of Maine Council on the Marine Environment/National Oceanic and Atmospheric Administration (NOAA) **Habitat Restoration Partnership Grants** provided $1.4 million in competitive awards to community-based organizations in Massachusetts, New Hampshire, Maine, New Brunswick, and Nova Scotia, leveraging $3.9 million in matching support. The 56 projects contributed to restoration of salt marshes, rivers, lakes, and other habitats for sea-run fish, shellfish habitats and populations, and shoreland (riparian) habitats. The program trained a hundred volunteers to monitor salt marshes and invasive species. The *Gulf of Maine Habitat Restoration Strategy*, developed by the Council and its partners, has guided the grant-making program. For more information, visit http://restoration.gulfofmaine.org.

- The Council produced and distributed the ***Gulf of Maine Marine Habitat Primer*** in 2005. The *Primer* enhances understanding of marine habitats in the Gulf of Maine; provides background needed to make more informed decisions on human uses, management, and conservation; and provides an initial step toward a habitat conservation strategy for the Gulf of Maine. The *Primer* is intended as a useful tool for resource managers, planners, legislators, conservation commissioners, NGO staff members, and others seeking a better understanding of marine habitats from Massachusetts to Nova Scotia. For more information, visit gulfofmaine.org/habitatprimer.

- Mapping the Gulf of Maine's seafloor is an essential step for ecosystem-based management of the region's marine environment. The Council helped form the **Gulf of Maine Mapping Initiative** (GOMMI), a U.S./Canada partnership of government and non-government organizations to conduct comprehensive seafloor imaging, mapping, and biological and geological surveys. GOMMI grew out of a mapping workshop in October 2001 that was sponsored by the Gulf of Maine Council and the National Oceanic and Atmospheric Administration. GOMMI is a subcommittee of the Council and is guided by a peer-reviewed strategic plan, the *Gulf of Maine Mapping Initiative: A Framework for Ocean Management*. For more information, visit gulfofmaine.org/gommi.

- The Council in partnership with the U.S. Environmental Protection Agency convened the **Northeast Coastal Indicators Workshop** in 2003. The workshop brought together some 90 scientists and managers to develop ecosystem indicators applicable to the northeast coastal region from New York to Nova Scotia. Building on the workshop, leaders from the Gulf of Maine region formed the **Ecosystem Indicator Partnership** (ESIP) with support from the Gulf of Maine Council. As a committee of the Council, ESIP began development of indicators for the Gulf of Maine region and integrating regional data for a new Web-based reporting system

for marine ecosystem monitoring. The indicators focus on coastal development, contaminants and pathogens, eutrophication, aquatic habitat, fisheries and aquaculture, and climate change. For more information, visit gulfofmaine.org/esip.

- In 2001, the Council led efforts with the U.S. Federal Aquatic Nuisance Species Task Force to form the **Northeast Aquatic Nuisance Species (NEANS) Panel**. The NEANS Panel addresses issues and concerns related to the freshwater and marine resources of its member states. Panel members represent state, federal, and provincial governments, academia, commercial and recreational fishing interests, recreational boaters, commercial shipping, power and water utilities, environmental organizations, aquaculture, nursery and aquarium trades, tribal concerns, lake associations, and the bait industry, among others. The Panel has four working committees: Communication, Education, and Outreach; Policy and Legislation; Science and Technology; and Shipping. For more information, visit northeastans.org.

NOAA

Habitat Restoration Partnership Grants
http://restoration.gulfofmaine.org
Between 2002 and 2006, the Gulf of Maine Council on the Marine Environment/National Oceanic and Atmospheric Administration (NOAA) Habitat Restoration Partnership Grants provided $1.4 million in competitive awards to community-based organizations in Massachusetts, New Hampshire, Maine, New Brunswick, and Nova Scotia, leveraging $3.9 million in matching support. The 56 projects contributed to the restoration of salt marshes, rivers, lakes, and other habitats for sea-run fish; shellfish habitats and populations; and shoreland (riparian) habitats.

Goal 2 (2001–2006) Contaminants in the Gulf of Maine are at sufficiently low levels to ensure human health and ecosystem integrity.

Selected accomplishments:

- **Gulfwatch** provides managers with information that they need to protect marine resources and human health. At nearly 60 sites around the Gulf of Maine, Gulfwatch measures contaminants including polycyclic aromatic hydrocarbons, polychlorinated biphenyls, chlorinated pesticides, and metals. For more information, visit gulfofmaine.org/gulfwatch.

- The **New Hampshire Shellfish Program uses Gulfwatch data** for evaluating the contamination of estuarine and coastal waters where shellfish are harvested for consumption. The concentrated monitoring program in New Hampshire develops baseline data for contaminants, determines the impact and fate of spilled oil in the Great Bay estuary, and establishes a petroleum-contamination baseline for assessing oil spill damage. Sampling sites include areas of critical habitat along New Hampshire's coast.

- The **Massachusetts Bays Program used Gulfwatch's sampling program design** to evaluate contaminant loading in Cohasset Harbor, after lobstermen noticed elevated mortality of lobsters in the inner harbor. Concerned about contamination from sewage discharges or non-point source pollution, a citizen group brought their concerns to the Massachusetts Bays Program. Staff collected water samples that were analyzed and compared with other Gulfwatch data. Gulfwatch has increased awareness among local governments of the availability of data and information on marine contaminants.

Gulfwatch
gulfofmaine.org/gulfwatch
Since 1993, Gulfwatch has measured contaminants in blue mussels (*Mytilus edulis*) to assess the types and concentration of contaminants in the coastal waters of the Gulf of Maine. Organized and administered by the Council, it is one of the few monitoring programs to be coordinated across international borders.

Mussel illustration © Ethan Nedeau

- At the regional level, **Gulfwatch has contributed to expanding efforts** in marine environmental monitoring, indicators, and environmental reporting around the Gulf of Maine. In addition, habitat restoration projects have used Gulfwatch data to evaluate the condition of rivers and estuaries and the implications of removing dams and other barriers.

- Canadian and U.S. water quality managers and scientists from the Gulf of Maine region convened in 2001 to discuss the **status and impacts of nitrogen loading**. Sponsored by the Council, the workshop produced twenty-four recommendations to the region's governments regarding nutrient assessment, monitoring, and prediction; control strategies; and policy, regulatory, and implementation issues.

- The Council sponsored a **workshop on sewage management** in April 2002 at the Bedford Institute of Oceanography in Dartmouth, Nova Scotia. Hosted by the Nova Scotia Department of Environment and Labour, the workshop explored issues related to the management of sewage and wastewater impacts in the Gulf of Maine and produced a set of recommended actions for the Council and other groups engaged in the issue.

Goal 3 (2001–2006) A marine research and monitoring strategy and a nature-based tourism strategy are developed and implemented.

Selected accomplishments:

- The Gulf of Maine Council co-organized a two-day **workshop on sustainable tourism** in October 2003, resulting in establishment of the Sustainable Tourism Task Force (SSTF). Approximately 50 members of the Gulf of Maine's tourism industry adopted a working definition of sustainable tourism and eight guidelines for sustainable tourism development. As one outcome of the event, the National Geographic Society's new geo-mapping program identified the Gulf of Maine as a possible project site, and two articles related to the Gulf of Maine appeared in *National Geographic Traveler* magazine.

- Participants in the **Gulf of Maine Summit** in 2004 saw the results of the first geomapping efforts. Presentations highlighted businesses in the region that had successfully implemented sustainable tourism practices. Next steps include a region-wide effort to promote the application of the guidelines for sustainable tourism development and helping to establish standards for a national sustainable tourism certification program.

Gulf of Maine Council Action Plan Grants
gulfofmaine.org/council/opportunities
The Gulf of Maine Council offers grants to citizen groups and community organizations to pursue projects that support its priority goals.

Selected Council Highlights from 2001–2006

Strategies and Summaries

- *Cross-border Indicators of Climate Change Over the Past Century: Northeastern United States and Canadian Maritime Region* (2006)
- *Salt Marshes of the Gulf of Maine: Long-term Monitoring to Assess Human Impacts and Ecological Condition* (2005)
- *Gulf of Maine Marine Habitat Primer* (2005)
- *Improving Links Between Science and Coastal Management: A Survey to Assess Science and Technology Needs in the Gulf of Maine* (2004)
- *Gulf of Maine Habitat Restoration Strategy* (2004)
- *A Survey of Coastal Managers' Science and Technology Needs Prompts a Retrospective Look at Science-Based Management in the Gulf of Maine* (2004)
- *In Pursuit of Data: Populating the Coastal Development Indicators* (2004)
- *Gulf of Maine Mapping Initiative: A Framework for Ocean Management*. Includes a needs assessment to document user priorities (2004)
- *Tides of Change Across the Gulf: An Environmental Report on the Gulf of Maine and Bay of Fundy* (2004)
- *Gulfwatch: Monitoring Chemical Contaminants in Gulf of Maine Coastal Waters* (2003)
- *Mapping the Undersea Landscape: Using Seafloor Maps to Improve Management of the Gulf of Maine* (2003)
- *Ocean Zoning for the Gulf of Maine: A Background Paper* (2003)

Workshops and Workshop Reports

- Marine Habitats in the Gulf of Maine: Assessing Human Impacts and Developing Management Strategies (2005)
- Gulf of Maine Summit: Committing to Change (2004)
- Northeast Coastal Indicators Workshop (2004)
- Atlantic Northeast Coastal Monitoring Summit (2002)
- Council Public Forum on Coastal Development
- Sewage Management in the Gulf of Maine (2002)
- Managing Nitrogen Impacts in the Gulf of Maine (2001)
- Gulf of Maine Marine Habitat Characterization and Mapping Workshop (2001)
- Aquaculture Remediation Workshop (2001)
- Environmental Quality Monitoring Workshop (2001)

Journal Articles

- Jones, S. H., L. White, P. Hennigar, P. Wells, C. Krahforst, G. Harding, J. Aube, G. Brun, J. Schwartz, M. Chase, P. Vass, N. Landry and J. Stahlnecker. 2006. Spatial and Temporal Trends of Chemical Contaminants in Tissues of the Blue Mussel, *Mytilus edulis* L., in the Gulf of Maine: 1993–2001, pp. 373-385, In, Molluscan Shellfish Safety. *Proceedings of the 5th International Conference on Molluscan Shellfish Safety*. Henshilwood, B., T. Deegan, T. McMahon, C. Cusack, S. Keaveney, J. Silke, M. O'Cinneide, D. Lyons, and P. Hess (Eds.). Galway, Ireland, June 14th-18th, 2004. The Marine Institute, Rinville, Oranmore, Galway, Ireland.
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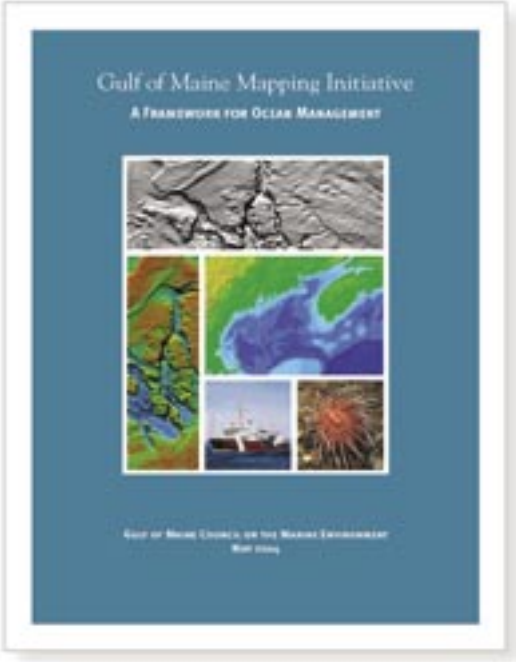
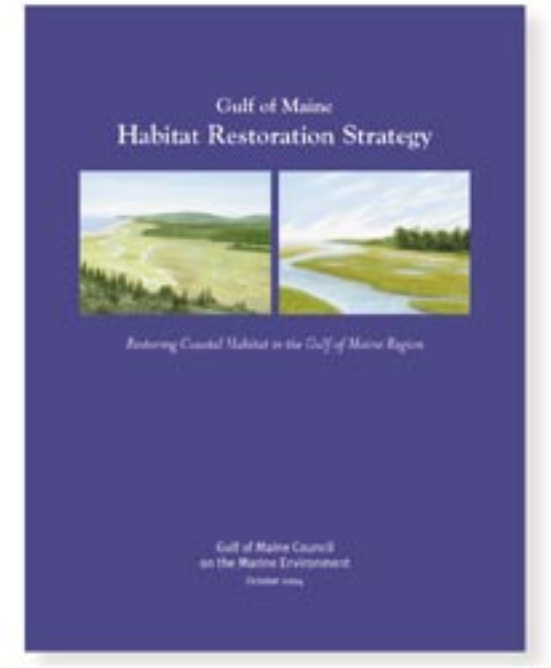


Initiatives and Projects

- Habitat Restoration Partnership Grants administered by the Council and the National Oceanic and Atmospheric Administration funded community-based projects.
- Science Translation Project accelerated transfer of



scientific findings to coastal decision-makers.
- *Gulf of Maine Times* educated readers about social, economic, environmental, and scientific issues.
- Action Plan Grants Program funded community organizations around the Gulf of Maine for projects contributing to the *Action Plan*'s goals.
- Gulfwatch assessed chemical contaminants in the Gulf of Maine's coastal waters.

Web-based Tools
- Gulf of Maine Council Web site redesigned and expanded for regional information sharing.
- Environmental Monitoring Program Locator: a searchable inventory of more than 250 Gulf of Maine monitoring programs.
- Directory for collaboration among more than 600 non-government organizations.
- Ecosystem Indicator Partnership (ESIP) Monitoring Map of monitoring sites and metadata.
- Gulfwatch Contaminants Monitoring Program online database, interactive map, and graphing.
- KnowledgeBase bibliographic database with geospatially searchable information on priority issues.
- Gulf of Maine Habitat Restoration Web Portal with interactive maps and databases of tidal restrictions, restoration projects, potential restoration sites, and other information for restoration practitioners.

Gulf of Maine Times
gulfofmaine.org/times
Launched by the Council in 1997, the *Gulf of Maine Times* is a free quarterly newspaper reaching a circulation of 10,000 scientists, municipal leaders, resource managers, educators, non-government organizations, and the general public. Through feature articles, profiles, book reviews, and essays, the *Gulf of Maine Times* educates readers about social, environmental, and scientific issues that impact the Gulf's complex ecosystems.

GulfofMaine.org
The Council's Web site offers a broad range of Gulf-related information and tools. Examples include the People Finder, a database with contact information for thousands of individuals involved in Gulf issues; a directory of hundreds of non-government organizations; the KnowledgeBase, containing documents, maps, and other information; the *Gulf of Maine Times*; meeting information; interactive mapping tools; and grant application materials.

Sea urchins feeding in the Gulf of Maine.
Photo: Ted Creaser

Goals for 2007–2012

The *Gulf of Maine Council on the Marine Environment Action Plan 2007–2012* focuses on three bold and ambitious goals identified by the people living and working around the Gulf of Maine.

Goal 1 **Coastal and marine habitats are in a healthy, productive, and resilient condition.**
Goal 2 **Environmental conditions in the Gulf of Maine support ecosystem and human health.**
Goal 3 **Gulf of Maine coastal communities are vibrant and have marine-dependent industries that are healthy and globally competitive.**

Using logic models (see box, below), the Council established short-, mid-, and long-term outcomes toward the goals, and activities to accomplish the outcomes. The *Action Plan* provides a broad description of the goals, outcomes, and activities. Detailed information is available in the *Work Plan* at gulfofmaine.org.

Performance measures and assessment procedures to measure progress toward the outcomes and goals are under development and can be found on the Council's Web site.

The goals and outcomes that this *Action Plan* seeks to accomplish are taken from the statutory mandates of the region's government agencies. The agencies work through the Council to address these mandates in a timely and cost-effective manner.

Canadian and U.S. federal agencies with statutory responsibilities in the coastal and marine environment are members of the Council and have a vital role in implementing this *Action Plan*.

Between 2007 and 2012, the Council will support signature activities that it is uniquely positioned to perform as a Canada/U.S. organization with a focus on the Gulf of Maine region. Examples of these activities include environmental monitoring, state-of-the-environment reporting, habitat restoration, and communication on Gulf-wide issues.

The Pieces of a Logic Model

Logic models are valuable tools for planning, goal setting, and evaluation. As defined by NOAA, logic models are "a systematic and visual way to present and share your understanding of the relationships among the resources you have to operate your program, the activities you plan to do, and the changes or results you hope to achieve." The Council used logic models as a framework for developing the *Action Plan*.

Activities	Short-term Outcomes	Mid-term Outcomes	Long-term Outcomes
The activities that the Council needs to conduct in order to achieve the desired outcomes.	Impacts of the project that occur immediately or within a few years, such as changes in the audience's understanding.	Intended impacts of the project that occur after several years, such as changes in the audience's behavior.	Ultimate impacts of the project on the issue, which may not occur for a decade or more.

Source: NOAA Coastal Services Center

Beds of seaweed along island shores.
Photo © Peter Taylor

Gulf of Maine Council Activities 2007–2012	Short-term Outcomes (within a few years)
a. Invasive Species Every two years, the Council and its partners develop a work plan with specific activities, including timeframes, budgets, deliverables, performance measures, and funding sources. See gulfofmaine.org. Examples of activities include: ✧ Assessing risks posed by invasive species in the Gulf of Maine. ✧ Setting priorities and supporting efforts to minimize and/or prevent harmful marine invasions.	✧ Coastal lawmakers have an increased understanding of threats from marine invasive species and options for reducing the threats. ✧ Commercial and recreational users of the Gulf of Maine have an increased understanding of the threat of marine invasive species and actions they can take to reduce the spread of invasive species. *See page 26 for a description of the significance of these short-term outcomes and why the Council is targeting them.*
b. Land-based Activities Every two years, the Council and its partners develop a work plan with specific activities, including timeframes, budgets, deliverables, performance measures, and funding sources. See gulfofmaine.org. Examples of activities include: ✧ Disseminating materials that increase awareness about effects of land-based activities on the coastal environment. ✧ Identifying and assessing the long-term economic, social, and ecological implications of projected coastal development patterns in the region.	✧ Coastal lawmakers have a greater understanding of how to minimize adverse effects of land-based activities on the coastal environment. *See page 26 for a description of the significance of this short-term outcome and why the Council is targeting it.*

Goal 1: Protect and Restore Habitats
Coastal and marine habitats are in a healthy, productive, and resilient condition.

This goal focuses on four related issues that affect the health of the Gulf of Maine, its watershed, and the marine economic sector.

a. Invasive Species. Non-native plants and animals pose a major threat to the ecosystem and economic uses of the Gulf.

b. Land-based Activities. Human activities on land can lead directly or indirectly to degradation of the Gulf of Maine.

Continued on page 21

Mid-term Outcomes (after several years)	Long-term Outcomes (after a decade or more)
✧ Coastal policy makers enact effective regional policies and programs to minimize adverse impacts of marine invasive species. ✧ Regulators implement legal instruments to minimize adverse impacts of marine invasive species. ✧ Users of the coastal and marine environment enact best practices to minimize adverse impacts of marine invasive species.	✧ The adverse effect of marine invasive species on the coastal environment is minimized.
✧ Coastal lawmakers enact, implement, and evaluate legislation that prevents land-based activities from adversely affecting the coastal environment. ✧ Municipal governments are continuously improving local planning tools and making infrastructure investments that minimize adverse impacts on the coastal environment. ✧ Watershed residents and businesses seek to minimize the effect of their land use decisions on the coastal environment.	✧ The impact of land-based activities on regionally significant coastal habitats is minimized.

Houses built on a barrier island.
Photo © Peter Taylor

Gulf of Maine Council Activities 2007–2012	Short-term Outcomes (within a few years)
c. Habitat Restoration Every two years, the Council and its partners develop a work plan with specific activities, including timeframes, budgets, deliverables, performance measures, and funding sources. See gulfofmaine.org. Examples of activities include: ✧ Disseminating information on the need for coastal habitat restoration. ✧ Funding restoration activities. ✧ Creating tools that managers need to accelerate habitat restoration.	✧ Non-government organizations working to conserve coastal lands have an increased understanding of the need to restore and monitor regionally significant coastal habitats. ✧ Local, non-profit, and corporate sources are aware of the need to increase funding for the restoration of regionally significant coastal habitats on public and private lands. *See page 26 for a description of the significance of these short-term outcomes and why the Council is targeting them.*
d. Marine Habitat Conservation Every two years, the Council and its partners develop a Work Plan with specific activities, including timeframes, budgets, deliverables, performance measures, and funding sources. See gulfofmaine.org. Examples of activities include: ✧ Communicating how ecosystem-based management can be accelerated in the Gulf of Maine. ✧ Developing the ecosystem-based tools that managers need. ✧ Building the capacity of managers for integrated approaches to management.	✧ Coastal lawmakers, decision-makers, and managers working at the Gulf of Maine scale have an increased understanding of how to apply ecosystem-based management to conserve and protect Gulf of Maine habitats and resources. *See page 26 for a description of the significance of this short-term outcome and why the Council is targeting it.*

Goal 1: Protect and Restore Habitats
Coastal and marine habitats are in a healthy, productive, and resilient condition.

Continued from page 19

c. Habitat Restoration. Habitats damaged by past human uses can be restored so they contribute to a properly functioning ecosystem. The Council focuses its efforts on regionally significant coastal habitats (RSCH). These are habitats that support priority, Gulf-wide plant and animal species and that meet certain ecological and social criteria as identified by the Council.

d. Marine Habitat Conservation. Developing and applying integrated, holistic approaches to management and policy is essential.

Mid-term Outcomes (after several years)	Long-term Outcomes (after a decade or more)
✧ Partners leverage and invest funds in restoration of regionally significant coastal habitats (RCSH). ✧ Non-government organizations increase funding for restoration. ✧ Practitioners implement regional restoration monitoring standards. ✧ Government agencies incorporate RSCH priorities into restoration plans. ✧ Communities are more involved in restoration. ✧ Public agencies and non-government organizations have better technical and financial capacity to undertake restoration.	✧ Impaired regionally significant coastal habitats are restored to support the desired functions and values of those habitats.
✧ Managers and regulators implement effective marine management initiatives and programs. ✧ Watershed residents demonstrate increased stewardship of the marine environment.	✧ Ecosystem-based management of regionally significant coastal habitats maintains ecological integrity.

Unloading lobster traps.
Photo © Peter Taylor

Gulf of Maine Council Activities 2007–2012

Every two years, the Council and its partners develop a work plan with specific activities, including timeframes, budgets, deliverables, performance measures, and funding sources. See gulfofmaine.org. Examples of activities include:

- ✧ Conducting contaminant and habitat monitoring.
- ✧ Providing information about priority contaminants and how lifestyle choices affect the condition of the marine environment.
- ✧ Responding to managers' needs for state-of-the-environment reporting and ecosystem indicators.

Short-term Outcomes (within a few years)

- ✧ Coastal lawmakers have increased knowledge about the need to reduce releases of priority pollutants that affect the Gulf of Maine.
- ✧ Adults living in coastal communities of the Gulf of Maine have increased awareness about how their lifestyle choices affect the condition of the marine environment.

See page 27 for a description of the significance of these short-term outcomes and why the Council is targeting them.

Goal 2: Foster Environmental and Human Health
Environmental conditions in the Gulf of Maine support ecosystem and human health.

This goal focuses on preventing and reducing water pollution. Many pollutants enter the Gulf of Maine and its watershed from licensed or permitted point-source discharges, nonpoint sources, and atmospheric deposition. Individually and cumulatively, these sources affect the ecosystem and in some cases limit human use of the Gulf's resources.

Regional collaboration is needed to strengthen the laws and programs that limit the release of important pollutants such as mercury, sewage, and excess nutrients. People living throughout the watershed have an important and lasting impact on the Gulf of Maine. Increasing the awareness of adults living in the watershed about the effect of their lifestyle choices on the marine environment is an important first step.

Mid-term Outcomes
(after several years)

- ✧ Coastal lawmakers enact consistent standards and guidelines that reduce contaminant releases.
- ✧ Residents of the Gulf of Maine's watershed implement voluntary lifestyle actions to reduce their use and release of contaminants.

Long-term Outcome
(after a decade or more)

- ✧ Environmental conditions of the marine environment improve as contaminant releases are reduced.

Sailboats and a working waterfront in the Gulf of Maine.
Photo © Peter Taylor

Gulf of Maine Council Activities 2007–2012

Every two years, the Council and its partners develop a work plan with specific activities, including timeframes, budgets, deliverables, performance measures, and funding sources. See gulfofmaine.org. Examples of activities include:

- ✧ Strengthening marine-dependent industry participation in Council tasks.
- ✧ Promoting communication about methodologies and case studies for incorporating natural capital valuation and socio-economic concepts into ecosystem-based management initiatives.
- ✧ Collaborating with local partners to ensure that working waterfronts remain viable.
- ✧ Increasing public awareness about alternative energy sources and fuels.

See page 27 for a description of the significance of the short-term outcomes and why the Council is targeting them.

Short-term Outcomes (within a few years)

- ✧ The level of participation in Council activities by marine-dependent industry representatives is increased.
- ✧ Coastal lawmakers have an increased understanding of the relevance of incorporating natural capital concepts in coastal decision-making. Natural capital is a term for the natural resources, habitats, ecological processes, and other non-human-created infrastructure that often are not fully considered in economic valuation and decision-making.
- ✧ Gulf-wide industry-specific collaboration results in greater awareness of applicable best practices.
- ✧ Coastal lawmakers have increased awareness of creative approaches to protect and manage the working waterfront infrastructure that marine-dependent industries require to remain competitive.
- ✧ Adults living in the Gulf of Maine's watershed have an increased awareness of products and services developed with alternate energy sources or fuels.

Goal 3: Support Vibrant Communities

Gulf of Maine coastal communities are vibrant and have marine-dependent industries that are healthy and globally competitive.

This goal addresses several aspects of the economic well-being of towns and cities along the coast of the Gulf of Maine:

- The Council views the leaders of marine-dependent industries as key decision-makers in ensuring a healthy and productive Gulf of Maine. It values and needs their active participation in Council committees, forums, and other activities to develop effective regional initiatives.
- The Council believes that the value of natural capital needs to be incorporated into provincial and state statutes, policies, and programs.
- Marine-dependent industries, particularly sustainable tourism, finfish aquaculture, and commercial bivalve shellfish harvesting, need to continually innovate to remain competitive and support vibrant coastal communities.
- Working waterfronts are essential to marine-dependent industries and often define the character of coastal communities.
- Increasing the use of alternate energy sources is critical for economic growth, energy stability, and environmental quality in the Gulf of Maine region.

Mid-term Outcomes
(after several years)

- Marine-dependent industries are utilizing renewable and non-renewable resources in ways that maintain ecosystem integrity.
- The public is willing to pay a fair price for marine products and services that are produced using sustainable practices.
- Marine-dependent industries accelerate the adoption of practices to become even more sustainable.
- Government and marine-dependent industries are working collaboratively to address social, cultural, environmental, and economic concerns.
- The value of coastal natural capital is incorporated into federal and provincial/state decision-making via laws, policies, and programs.

Long-term Outcomes
(after a decade or more)

- Coastal communities are supportive of marine-dependent industries, and the industries are implementing innovative, sustainable best practices that position them favorably for the future.
- Marine-dependent industries are sustainable and competitive in global markets.

Appendix A: Significance of the *Action Plan*'s Short-term Outcomes

Goal 1: Protect and Restore Habitats

a. Invasive Species

Outcome: Coastal lawmakers have an increased understanding of the threat posed by marine invasive species and options for reducing the threat.

Invasive species are considered one of the greatest threats to coastal environments and can substantially alter the abundance, diversity, and distribution of many native species. The availability of habitat and absence of natural predators and competitors can lead to runaway growth that overwhelms other species. Unlike many forms of pollution that degrade over time, invasive species can persist and increase. The spread of non-indigenous plant and animal species poses a significant threat to the ecosystem and human uses of the Gulf of Maine. The introduction of invasive species into ports, coastal areas, and watersheds has damaged marine ecosystems around the world, costing millions of dollars in remediation, monitoring, and ecosystem damage.

Outcome: Commercial and recreational users of the Gulf of Maine have an increased understanding of the threat of marine invasive species and actions they can take to reduce the spread of invasive species.

Many people rely on the Gulf of Maine for their livelihood and recreation. Through their actions, commercial (e.g., fishers, shipping companies, marine tradespeople, etc.) and recreational (e.g., fishers, boaters, beachgoers, etc.) users can assist in preventing and reducing the spread of invasive species. Users can also act as sentinels to detect and report the occurrence of unfamiliar species so that others are able to eradicate or contain harmful invasivers.

b. Land-based Activities

Outcome: Coastal lawmakers have an increased understanding of how to minimize adverse effects of land-based activities on the coastal environment.

Throughout the Gulf of Maine, the patterns of land development, often in scattered and unplanned clusters of homes and businesses, have an important effect on the coastal environment. Urban and suburban sprawl increases the need for infrastructure such as roads, bridges, and sewers, degrading the coastal environment while often making fragile or hazard-prone areas more accessible to development. The volume of polluted runoff from urban and suburban areas is exacerbated by increases in impervious surfaces, such as roads, parking lots, sidewalks, and rooftops. Contaminants from these non-point sources combine with point sources and atmospheric deposition. These activities are adversely affecting ecosystem health and people's ability to use the coastal environment.

c. Habitat Restoration

Outcome: Non-government organizations working to conserve coastal lands have an increased understanding of the need to restore and monitor regionally significant coastal habitats.

There are plant, fish, and wildlife habitats of regional significance throughout the Gulf of Maine. These special areas are unique within the Gulf of Maine ecosystem and often support a host of species that require transboundary cooperation for their effective management. (See *Gulf of Maine Habitat Restoration Strategy*, 2004.) Human activities have degraded some of these regionally significant coastal habitats, and it is timely to accelerate the pace of restoration. Important work is underway throughout the region to protect and restore some of our most precious lands. Often leading these efforts are local land trusts, watershed associations, friends groups, and provincial or statewide non-government organizations that are partnering in effective ways. A critical first step is to increase the capacity of these organizations to organize, manage, and monitor restoration projects.

What Is Ecosystem-based Management?
Ecosystem-based management (EBM) is an integrated approach to management that considers the entire ecosystem, including humans. In the past, management strategies typically have focused exclusively on single species, which often has not been successful because complex interactions of species and environmental processes result in ecosystem changes. Many organizations are now adopting an ecosystem-based approach to policy and management. The goal of ecosystem-based management is to maintain an ecosystem in a healthy, productive, and resilient condition so that it can provide the services humans want and need.

Outcome: Local, non-profit, and corporate sources are aware of the need to increase funding for the restoration of regionally significant coastal habitats on public and private lands.

The restoration of coastal habitats is necessary to meet the region's biological and socio-economic needs. Restored habitats provide communities with opportunities for sustainable commercial fishing, recreation, and nature-based tourism. Critical biological needs are also addressed when the functions and values of coastal habitats, degraded by years of human activity, are restored. Currently, the amount of degraded habitat in the Gulf of Maine region far exceeds the financial resources available for habitat restoration. Further, federal funds for restoration far exceed funds from other sources. More lands could be restored if additional non-federal funding sources were available.

d. Marine Habitat Conservation

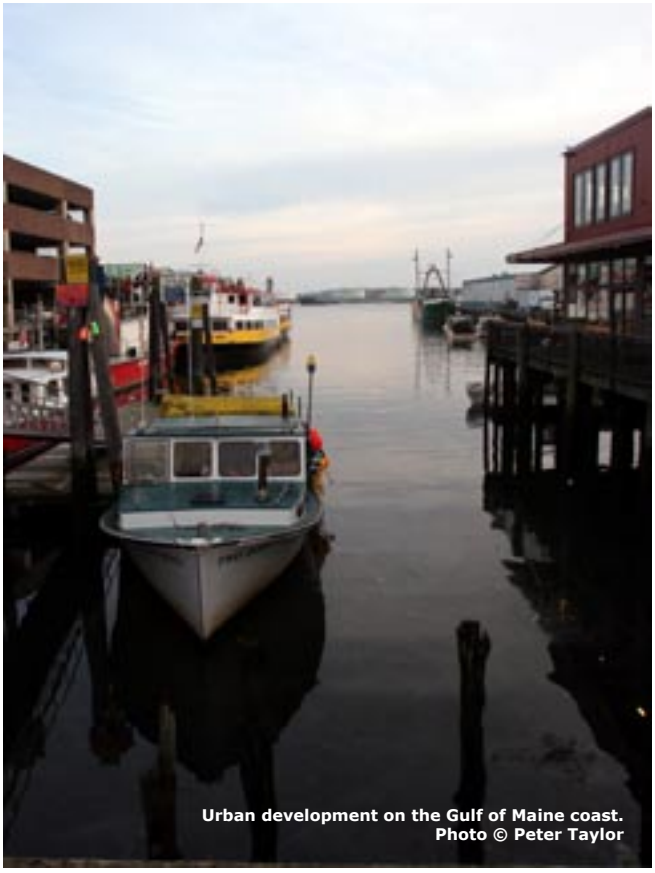
Outcome: Coastal lawmakers, managers, and other decision-makers working at the Gulf of Maine scale have an increased understanding of how to apply ecosystem-based management to conserve and protect Gulf of Maine habitats and resources.

Government and non-government organizations (e.g., commercial fishermen and marine trade organizations, environmental organizations) are responsible for designing and implementing coastal and marine conservation initiatives throughout the Gulf of Maine. These decision-makers need a strong understanding of how the Gulf's ecosystem functions and the conservation options available to protect ecosystem functions and values. Given the recent renewed commitment of the federal governments in Canada and the United States to pursue ecosystem-based approaches, the Council seeks to increase awareness about these approaches.

Goal 2: Environmental and Human Health

Outcome: Coastal lawmakers have increased knowledge about the need to reduce releases of priority pollutants that affect the Gulf of Maine.
Releases of priority pollutants to the waters of the Gulf of Maine, including its watershed, occur through licensed and permitted point source discharges, nonpoint sources of pollution (e.g., stormwater, agriculture, silviculture, marinas) and atmospheric deposition. Individually and cumulatively, these sources have detectable effects on the ecosystem and in some instances limit human use of the Gulf's resources. Given the Gulf's oceanographic characteristics, the region's coastal lawmakers need to work collaboratively to strengthen the laws and programs affecting the releases of priority pollutants (e.g., mercury, sewage, nutrients). A first step is to ensure that lawmakers are aware of the need to reduce these pollutants.

Outcome: Adults living in coastal communities of the Gulf of Maine have increased awareness about how their lifestyle choices affect the condition of the marine environment.
People living throughout the watershed have an important and lasting impact on the Gulf of Maine. For example, the lifestyle choices they make affect the type and amount of solid waste they generate, their use of household chemicals, their choices of daily transportation options and resulting emissions, the location and the patterns of development, and the way they maintain their lawns and yards. Increasing the awareness of adults living in the watershed about the effect of their lifestyle choices on the marine environment is a first step in reducing the cumulative effects of these activities on the Gulf of Maine.



Urban development on the Gulf of Maine coast. Photo © Peter Taylor

Goal 3: Support Vibrant Communities

Outcome: The level of participation in Council activities by marine-dependent industry representatives is increased.
The Council views the leaders of marine-dependent industries as key decision-makers in ensuring a healthy and productive Gulf of Maine. Thus it needs their active participation in Council committees, forums, periodic Web-based inquiries, and other activities to develop effective regional initiatives.

Outcome: Coastal lawmakers have an increased understanding of the relevance of incorporating natural capital concepts in coastal decision-making.
The term "natural capital" describes the natural system that provides space, substratum, and renewable and non-renewable resources that support and regulate the physical, biological, and chemical processes in the coastal zone. The ongoing replacement of natural capital by physical capital (i.e., the built environment) may not be sustainable. Further, the non-monetary value of open landscapes and functioning ecosystems is not fully considered in economic valuation and decision-making. A way to begin addressing this issue is by working to incorporate natural capital valuation into provincial and state statutes, policies, and programs.

Outcome: Gulf-wide industry-specific collaboration results in greater awareness of applicable best practices.
Marine-dependent industries—particularly sustainable tourism, finfish aquaculture, and commercial bivalve shellfish harvesting—need to continually innovate to remain competitive and support vibrant coastal communities.

Outcome: Coastal lawmakers have increased awareness of creative approaches to protect and manage the working waterfront infrastructure that marine-dependent industries require to remain competitive.
The Gulf's working waterfronts consist of sites or facilities that provide physical access to the sea for commercial use, as well as related infrastructure and services. These areas are essential to our marine-dependent industries and often define the character of coastal communities. Provincial and state lawmakers, local officials (e.g., town councilors, selectboards, municipal, and local service district representatives), and planning authorities are often searching for creative ways to protect and maintain these working waterfronts.

Outcome: Adults living in the Gulf of Maine watershed have an increased awareness of products and services developed with alternate energy sources or fuels.
Increasing the use of alternate energy sources is essential for economic growth and energy stability in the Gulf of Maine region. It is also critical to lessen reliance on fossil fuels in order to reduce the associated environmental impacts such as climate change and air pollution. Developing markets for products and services produced with alternate energy sources is a key step in promoting their use.

Appendix B: Glossary

Cumulative impacts The combined effect of human activities on the ecosystem. Cumulative impacts can result from multiple instances of the same activity or from different activities. The activities need not occur at the same place or time to result in cumulative impacts on the ecosystem. For example, construction of roadways, building of seawalls, and use of lawn fertilizers and pesticides along the shores of a particular bay may be done by different people on their properties over a period of years. Together these activities result in cumulative impacts on the coastal marine ecosystem.

Ecosystem A dynamic complex of plants, animals, microbes, and physical environmental features that interact with one another. Humans are an integral part of ecosystems, marine and terrestrial. The interconnectedness within and among ecosystems is provided both by the physical environment (for example, currents transporting larvae from one part of the ecosystem to another) and by biological interactions (for example, kelps or sea grasses creating habitat or predators consuming prey). McLeod *et al*. 2005

Ecosystem services The conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfill human life. Examples include provision of clean water, maintenance of livable climates (carbon sequestration), pollination of crops and native vegetation, and fulfillment of people's cultural, spiritual, intellectual needs. Marine ecosystems benefit humans by providing services such as food (fish, shellfish and seaweed); medicines; water purification; protection of shorelines from erosion and storm damage; control of diseases and pests; nutrient cycling; moderation of climate and weather; recreation; and spiritual, religious and other nonmaterial benefits. The interactions within an ecosystem produce these services. Each ecosystem provides a range of services. Although some goods (fish and shellfish) have significant economic value, most other essential services are not commonly assigned economic worth. Examples of services that are at risk because they are undervalued include protection of shorelines from erosion, nutrient recycling, control of disease and pests, climate regulation, cultural heritage, and spiritual benefits. Current economic systems attach no dollar values to these services; they are typically not considered in policy decisions and many are at risk. McLeod *et al*. 2005

Ecosystem-based management An integrated approach to management that considers the entire ecosystem, including humans. The goal of ecosystem-based management is to maintain an ecosystem in a healthy, productive, and resilient condition so that it can provide the services humans want and need. Ecosystem-based management differs from current approaches that usually focus on a single species, sector, activity, or concern; it considers the cumulative impacts of different sectors. Specifically, ecosystem-based management: emphasizes the protection of ecosystem structure, functioning, and key processes; is place-based in focusing on a specific ecosystem and the range of activities affecting it; explicitly accounts for the interconnectedness within systems, recognizing the importance of interactions between many target species or key services and other non-target species; acknowledges interconnectedness among systems, such as between air, land, and sea; and integrates ecological, social, economic, and institutional perspectives, recognizing their strong interdependences. McLeod *et al*. 2005

Gulf of Maine A 36,000-square-mile area of the northwest Atlantic Ocean bordered by three states (Massachusetts, New Hampshire, and Maine) in the northeastern United States and two provinces (New Brunswick and Nova Scotia) in Canada. Among the richest marine ecosystems in the world. Supports renowned fisheries. Georges Bank and Browns Bank mark the offshore boundary between the Gulf of Maine and the rest of the Atlantic Ocean.

Gulf of Maine watershed Total land area of 69,115 square miles (179,008 square kilometers) that drains into the Gulf of Maine. Encompasses much of Nova Scotia, New Brunswick, New Hampshire, and Massachusetts, all of Maine, and a small portion of Quebec.

Habitat The place where an animal or plant lives and that has the environmental conditions needed for that species to survive. Habitats support many different communities of animals and plants. Natural or human-caused activities may change habitats and the species living there. Examples of habitats in the Gulf of Maine include rocky reefs, salt marshes, eelgrass beds, and sandy or muddy bottoms.

Habitat restoration The process of returning a polluted or degraded habitat—such as a salt marsh, eelgrass bed, or river—to its natural condition. The goal of habitat restoration is to help the structure and functions of habitats, enabling them to play their natural roles in the ecosystem. Habitat restoration projects expedite the process to rebuild a healthy ecosystem that functions like it did prior to being degraded. Restoration projects usually address entire habitats that can support numerous species, rather than focusing on single species.

Rocky intertidal habitat.
Photo © Peter Taylor

Indicators Quantitative or qualitative measures that provide information about the status of or changes in natural, cultural, and economic aspects of an ecosystem. Examples of some possible indicators include coliform bacteria counts, measures of harmful algal blooms, levels of toxic chemicals in seafood, and abundance and diversity of fish and invertebrate species.

Invasive species A non-native plant or animal species that has been deliberately or accidentally transported and released into a foreign environment through human activities and has successfully taken hold in that environment, causing ecological damage in the process. Also called alien, exotic, introduced, non-indigenous, and aquatic nuisance species.

Land-based activities Human activities on land that directly or indirectly affect the coastal and marine ecosystem. Examples include land development, pollution emissions, and use of fertilizers and pesticides.

Natural capital The living and non-living components of Earth that provide ecosystem services such as oxygen production, water filtration, food production, and erosion prevention.

Nonpoint source pollution Pollution originating from diffuse sources, such as runoff of chemicals from the land and deposition of airborne pollutants.

Point-source pollution Pollution originating from a well-defined point, such as a pipe. Discharge from a sewage treatment plant is an example of point-source pollution.

Regionally significant coastal habitats (RSCH) A term used by the Gulf of Maine Council on the Marine Environment for habitats that the Council has identified as regional priorities for management, protection, and restoration.

Science translation The process of transferring scientific facts and knowledge to people who are not scientists (e.g., resource managers, policy makers, educators, the public) using audience-specific communication strategies and techniques.

Sustainable development Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Working waterfront Sites and facilities providing physical access to the sea for commercial fishing and other marine commercial activities; additonal facilities and services, which may not be located immediately at the shore, needed to support marine commercial activities.

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The coast of the Gulf of Maine.
Photo © Peter Taylor

The Gulf of Maine Council on the Marine Environment's mission:
"To maintain and enhance environmental quality in the Gulf of Maine and to allow for sustainable resource use by existing and future generations."

Gulf of Maine Council on the Marine Environment

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ISBN 978-0-9791540-0-3